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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/582,398

09/05/2006

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EXAMINER

ARMAND, MARC ANTHONY

ART UNIT

PAPER NUMBER

2814

MAIL DATE

DELIVERY MODE

12/24/2008

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/582,398	Applicant(s) NAKAYAMA ET AL.	
	Examiner MARC ARMAND	Art Unit 2814	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 17 September 2008.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-12 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☐ Claim(s) 1-8, 11 and 12 is/are rejected.
- 7) ☒ Claim(s) 9 and 10 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>08/08/2008</u> | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

3. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Art Unit: 2814

4. Claims 1-8, 11, 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Igaki et al., (Igaki) USPAT 7,026,654 in view of Natarajan et al., (Natarajan) US 2005/0067949.

Regarding to claims 1-4, 11, 12 Igaki shows in fig.12 an organic light-light conversion device comprising:

- a light sensing unit having a layer including a photo-conductive organic semiconductor (31)(col.5,line 63) that causes a photo-current multiplication phenomenon by light irradiation;
- a light emitting unit having a layer including an electroluminescent organic semiconductor (21)(col.5,line 60-65) that emits light by current injection, characterized in that at least one of the photo-conductive organic semiconductor;
- a unit (shown in fig.12) which measures and out put a voltage applied to both ends of the layer including the electroluminescent organic semiconductor (device designed for highly optical measurements)(col.6,line 30-35);
- Igaki differs from the claimed invention because he does not explicitly disclose a semiconductor device having the photo-conductive organic semiconductor and the electroluminescent organic semiconductor is a polymer semiconductor. Natarajan discloses a photo-conductive organic

semiconductor and the electroluminescent organic semiconductor that is a polymer semiconductor (para 0020, para0043).

- Natarajan is evidence that ordinary workers skilled in the art would find reasons, suggestions or motivations to modify the device of Igaki.

Therefore, at the time the invention was made; it would have been obvious to have a photo-conductive organic semiconductor and the electroluminescent organic semiconductor that is a polymer semiconductor because it will improve the device performance and device lifetime.

As for the statements: “photo-conductive organic semiconductor that causes a photo-current multiplication phenomenon by light irradiation” and “electroluminescent organic semiconductor that emits light by current injection” are considered functional languages; labels statements of intended use, or functional language do not structurally distinguish claims over prior art, which can function in the same manner, be labeled in the same manner, or be used in the same manner. See MPEP 2112.

Regarding to claim 5 Igaki shows in fig.12 a semiconductor device comprising:
a) a light sensing unit having a layer including the photo-conductive organic semiconductor (31), b) a light emitting unit having a layer including the electroluminescent organic semiconductor (21) placed on a different location from the light sensing unit on the same substrate (11), and c) a conductive layer (14) connecting the light sensing unit to the light emitting unit laid on the same substrate.

Regarding to claim 6 Igaka shows in fig.12 a semiconductor device wherein a light shielding member (16) (fig.4) (col.4, line 55-60) is provided between the light sensing unit (31) and light emitting unit (21).

Regarding to claim 7 Igaka shows in fig.12, a semiconductor device where the a translucent member (16)(resin) having a transmittance that suppresses but does not completely shield the flow of feedback light into the light sensing unit is provided between the light sensing unit and the light emitting unit (shown in fig.12).

Regarding to claim 8, Igaka shows in fig.12 a semiconductor device wherein the light sensing unit having a layer including the photo-conductive organic semiconductor (31) is integrally laminated with the light emitting unit having a layer including the electroluminescent organic semiconductor (21).

Claim Rejections - 35 USC § 102

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

6. Claims 1 and 11 are rejected under 35 U.S.C. 102(a) as being as being unpatentable over Kalveram (Kalveram) US 2006/0098203.

Regarding claims 1 and 11, kalveram shows in fig.1 a semiconductor light device comprising a polymer photodiode (para 0026) (applicant's light sensing unit) having a layer including a photo detector (para 0026) (applicant's photo-conductive) organic semiconductor that causes a photo-current multiplication phenomenon by light

Art Unit: 2814

irradiation, and a light emitting unit (30)(para 0027) having an organic light emitting layer (26) (applicant's layer including an electroluminescent organic semiconductor) that emits light by current injection, characterized in that at least one of the photo detector (para 0026)(applicant's photo-conductive) organic semiconductor and the organic light emitting layer (26)(para 0027) (applicant's electroluminescent organic semiconductor) is a polymer (22)(para 0032) semiconductor.

As for the statements: "photo-conductive organic semiconductor that causes a photo-current multiplication phenomenon by light irradiation" and "electroluminescent organic semiconductor that emits light by current injection" are considered functional languages; labels statements of intended use, or functional language do not structurally distinguish claims over prior art, which can function in the same manner, be labeled in the same manner, or be used in the same manner. See MPEP 2112.

Regarding claim 2, Kalveram shows in fig.1, a semiconductor light device where the photo detector (24) (para 0026) (applicant's photo-conductive) organic semiconductor is a polymer photodiode (220 (para 0032) semiconductor).

Regarding claim 3, Kalveram shows in fig. 1 a semiconductor light device where the organic light emitting device layer (26) (para 0027) (applicant's electroluminescent organic semiconductor) is a polymer (para 0011) semiconductor.

Regarding claim 4, Kalveram shows in fig.1 a semiconductor light device where the photo detector (24) (para 0026) (applicant's photo-conductive organic

Art Unit: 2814

semiconductor) and the organic light emitting device layer (26) (para 0027) (applicant's electroluminescent organic semiconductor) are polymer semiconductors.

Regarding claim 5, Kalveram shows in fig.1 a semiconductor light device comprising: a) a Photodiode (22)(para 0026)(applicant's light sensing unit) having a layer including the (photo detector (24)(para 0026)(applicant's photo-conductive organic semiconductor), b) a light emitting unit (14) having a layer including the organic light emitting device layer (26)(para 0027) (applicant's electroluminescent organic semiconductor) placed on a different location from the light sensing unit (22)(para 0026) on the same substrate (18)(para 0026), and c) a conductive layer (28)(para 0027) connecting the light sensing unit (22) to the light emitting unit (14) laid on the same substrate (18)(para 0027).

Regarding claim 8, Kalveram shows in fig.1 a semiconductor light device wherein the light sensing unit (22) (para 0026) having a layer including the photo detector (24) (para 0026) (applicant's photo-conductive organic semiconductor) is integrally laminated with the light emitting unit (14) (para 0027) having a layer including the organic light emitting device layer (26) (para 0027) (applicant's electroluminescent organic semiconductor).

Regarding claim 12, Kalveram shows in fig.1 a semiconductor light device having a light sensing unit (22)(para 0026) having a layer including a photo detector (24)(para 0026)(applicant's photo-conductive organic semiconductor) that causes a photo-current multiplication phenomenon by light irradiation, and a light emitting unit (14) having a

Art Unit: 2814

layer including an organic light emitting device layer (26)(para 0027) (applicant's electroluminescent organic semiconductor) that emits light by current injection, characterized in that at least one of the photo detector (24)(para 0026)(applicant's photo-conductive organic semiconductor) and the organic light emitting device layer (26)(para 0027) (applicant's electroluminescent organic semiconductor) is a polymer (para 0011 and para 0032) semiconductor, and a Photodiode (22) used as a means to measure and output a voltage applied to both ends of the layer including the organic light emitting device layer (26)(para 0027) (applicant's electroluminescent organic semiconductor).

As for the statements: "photo-conductive organic semiconductor that causes a photo-current multiplication phenomenon by light irradiation" and "electroluminescent organic semiconductor that emits light by current injection" are considered functional languages; labels statements of intended use, or functional language do not structurally distinguish claims over prior art, which can function in the same manner, be labeled in the same manner, or be used in the same manner. See MPEP 2112.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Art Unit: 2814

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

6. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kalveram in view of Paritsky et al. (Paritzky) US 2003/0173507.

Regarding claim 6, Kalveram shows in fig.1 a semiconductor light device having a light sensing unit (22) and a light-emitting unit (14)(para 0027).

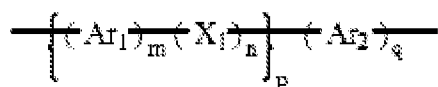
Kalveram differs from the claimed invention because he does not explicitly disclose a device wherein a light shielding member is provided between the light sensing unit and light emitting unit.

Paritsky shows in fig.2 a light device having a light shielding member (15) (para 0031) that is provided between the light sensing unit (14a and 14b) and light emitting unit (13) (para 0031).

Paritsky is evidence that ordinary worker skilled in the art would find a reason, suggestion or motivation to modify the device of Kalveram. Therefore, it would have been obvious at the time the invention was made, to have a light shielding member that is provided between the light sensing unit and light emitting unit because it will allow the device to block the light from direct exposure to the light source (para 0031) and also the device will increase sensitivity (para 0005).

Allowable Subject Matter

7. Claims 9 and 10 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. The prior art of record neither anticipated nor rendered obvious all the limitation of claim 9 including a polymer semiconductor that contains one or more repeating units be the formula:



Wherein Ar.sub.1 and Ar.sub.2 each independently represent an arylene group or a divalent heterocyclic group. X.sub.1 represents --CR.sub.1.dbd.CR.sub.2--, --C.ident.C-- or --N(R.sub.3)--; R.sub.1 and R.sub.2 each independently represent a hydrogen atom, an alkyl group, an aryl group, a monovalent heterocyclic group, a carboxyl group,

Art Unit: 2814

a substituted carboxyl group or a cyano group; R.sub.3 represents a hydrogen atom, an alkyl group, an aryl group, a monovalent heterocyclic group, an arylalkyl group or a substituted amino group. Moreover, the prior art of record neither anticipated nor rendered obvious all the limitation of claim 5 including a translucent member provided between the light sensing unit and light emitting unit.

Response to Arguments

8. Applicant's arguments with respect to claims 1-8, 11, and 12 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to MARC ARMAND whose telephone number is (571)272-9751. The examiner can normally be reached on 9-5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wael Fahmy can be reached on 571-272-1705. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 2814

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/MARC ARMAND/
Examiner, Art Unit 2814

/Wai-Sing Louie/
Primary Examiner, Art Unit 2814